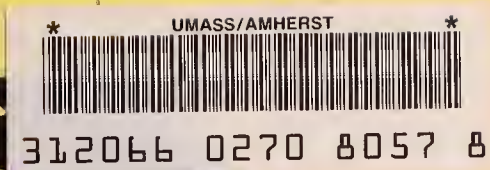


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**Assessment of past Implementation
of Local Water Quality
Recommendations in the Buzzards
Bay Drainage Basin**

**Southeastern Regional
Planning and Economic
Development District**

BBP-89-13



The Buzzards Bay Project is sponsored by The
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ASSESSMENT OF PAST IMPLEMENTATION OF
LOCAL WATER QUALITY RECOMMENDATIONS
IN THE BUZZARDS BAY DRAINAGE BASIN

AUGUST 1987

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FOREWORD

In 1984, Buzzards Bay was one of four estuaries in the country chosen to be part of the National Estuary Program. The Buzzards Bay Project was initiated in 1985 to protect water quality and the health of living resources in the bay by identifying resource management problems, investigating the causes of these problems, and recommending actions that will protect valuable resources from further environmental degradation. This multi-year project, jointly managed by United States Environmental Protection Agency and the Massachusetts Executive Office of Environmental Affairs, utilizes the efforts of local, state, and federal agencies, the academic community and local interest groups in developing a Master Plan that will ensure an acceptable and sustainable level of environmental quality for Buzzards Bay.

The Buzzards Bay Project is focusing on three priority problems: closure of shellfish beds, contamination of fish and shellfish by toxic metals and organic compounds, and high nutrient input and the potential pollutant effects. By early 1990, the Buzzards Bay Project will develop a Comprehensive Conservation and Management Plan to address the Project's overall objectives: to develop recommendations for regional water quality management that are based on sound information, to define the regulatory and management structure necessary to implement the recommendations, and to educate and involve the public in formulating and implementing these recommendations.

The Buzzards Bay Project has funded a variety of tasks that are intended to improve our understanding of the input, fate and effects of contaminants in coastal waters. The Project will identify and evaluate historic information as well as generate new data to fill information gaps. The results of these Project tasks are published in this Technical Series on Buzzards Bay.

This report represents the technical results of an investigation funded by the Buzzards Bay Project. The results and conclusions contained herein are those of the author(s). These conclusions have been reviewed by competent outside reviewers and found to be reasonable and legitimate based on the available data. The Management Committee of the Buzzards Bay Project accepts this report as technically sound and complete. The conclusions do not necessarily represent the recommendations of the Buzzards Bay Project. Final recommendations for resource management actions will be based upon the results of this and other investigations.



David Fierra, Chairman, Management Committee
Environmental Protection Agency

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INTRODUCTION

This report, "Assessment of Past Implementation of Local Water Quality Recommendations in The Buzzards Bay Drainage Basin", is one of a series of SRPEDD planning reports on local regulation in Buzzards Bay communities. It follows up on the "Inventory of Local Regulations Pertaining To Water Quality" by examining previous water quality management efforts at the regional and local levels to identify implementation problems and opportunities.

Other reports in this series include "Model Bylaws and Regulations" and the "Technical Resource Manual."

As part of the 1978 208 Planning Program, SRPEDD developed recommendations to protect water quality through zoning, subdivision and health regulations, land acquisition, and extension of sewer service area. At this time, it is appropriate to determine which of the 208 Plan management measures have been adopted and which have not. Local management recommendations will be summarized, measures adopted and those not adopted will be evaluated to identify the likely reasons for success or failure.

STORMWATER RUNOFF

The 208 Plan identified runoff as a major non-point pollution problem contributing contaminants such as metals, nutrients, bacteria, silt, road salt, organic material and petroleum products to surface waters. The following measures were proposed for the control of runoff pollution.

The 208 Plan recommended that state and local highway officials improve road maintenance practices which reduce the contaminants in runoff such as street sweeping and catch basin cleaning. This remains a problem in the Buzzards Bay municipalities as not all highway departments are able to keep roadways clean and catch basins maintained. The 208 Plan also recommended that all salt storage areas be covered and the amount of de-icing chemicals used be reduced. The Towns of Bourne, Dartmouth, Fairhaven, Falmouth, Marion, Middleborough, and Plymouth have adopted Aquifer Protection Zoning Districts which specifically prohibit or restrict by special permit the storage of salt. Although outdoor storage of salt, road application, and dumping of salt-contaminated snow and sand remains a water quality problem in some communities, the DPW salt shed program has allowed several communities (such as New Bedford, Wareham, and Mattapoisett) to make strides toward remedying this problem.

In addition to measures to reduce the pollutants in runoff, the 208 Plan recommended reducing the total runoff volume through subdivision and special permit regulations requiring the maximum use of on-site infiltration techniques (dry wells, retention basins, gravel driveways, porous pavement, etc.). Little improvement has occurred in requirements for the reduction of runoff although these controls could be required with little or no extra expense to the municipality. Unfortunately, most subdivision regulations require that runoff be collected in storm drains and disposed of in the nearest surface water channel. Regulations often add to runoff problems by requiring features such as wide streets, piped drainage, double sidewalks, and paved driveways, all of which retard the infiltration of water into the ground. A few communities have made progress in improving control of stormwater runoff. Westport allows limited exceptions to the subdivision requirements for 26 foot wide paved roads while Bourne and Falmouth require that wherever feasible stormwater be recharged rather than piped to surface waters. In addition, Falmouth's regulations prohibit the installation of drainage structures within 100 feet of a natural wetland.

EARTH REMOVAL

The 208 Plan recommended that officials review local bylaws or ordinances on gravel removal to see if their regulations adequately protect water quality. Specifically, the Plan recommended that communities enact bylaws or ordinances limiting excavation to four feet above the watertable to retain the sand or gravel purifying filter and protect the groundwater from pollutants. The Towns of Fairhaven and Falmouth have adopted earth removal bylaws which restrict the depth of gravel removal to no more than six and ten feet respectively above the high water table. None of the other municipalities have bylaws which restrict the depth of gravel removal. All of the communities seem to have experienced difficulties in enforcement of horizontal and vertical expansion of earth removal operations.

EROSION

The 208 Plan outlined several local options to curb erosion and sedimentation problems. Zoning regulations or an erosion control bylaw may prohibit or place conditions on construction in areas where the slope is 15 percent or greater. The 208 Plan recommended a general regulation which would cover all development on steeply sloping land. None of the municipalities within the Buzzards Bay basin have adopted this type of regulation.

The 208 Plan also recommended that planning boards adopt regulations addressing the control of erosion. These subdivision regulations can require that plans include calculations of the existing average annual erosion and the expected annual erosion during and after construction. Applications may be required to include an outline of the land area that will be exposed and erosion control plans to keep sediments out of wetlands, regrade topsoil from the site, and establish permanent vegetative cover.

LANDFILLS

The 208 Plan recognized landfills to be one of the most significant non-point pollution problems and recommended several types of regulatory responses.

The first, demand reduction, involves reducing the volume of waste going into the landfill through source reduction and recycling. This may include measures such as a tax on unnecessary packaging; the revenues could then be returned to municipalities for the design, construction and operation of landfills. Recycling of glass, metals and paper would also reduce the waste flow into landfills.

Industrial recycling would help remove metals and chemicals from the waste stream. Leachate generation is largely the result of the decay of organic matter which produces an acidic, oxygen deficient environment favorable to the movement of metals and other contaminants. Therefore, materials such as garbage, leaves and brush, should be kept out of landfills and disposed of separately through burying, feeding to livestock, or composting. The State has been pursuing landfill demand reduction through passage of the Bottle Bill and DEM's industrial source reduction program. However, local efforts are on a voluntary basis only - none of the municipalities require recycling - and are limited to few provisions for recycling of paper, glass or oil and separate disposal areas for leaves and brush.

The second recommendation was to use resource recovery technologies to dispose of waste and generate steam. A waste-to-energy plant, SEMASS, is currently under construction in Rochester. The plant will accept waste from the following communities: Rochester, Marion, Wareham, Fairhaven, Mattapoisett, Acushnet, Middleboro, Freetown, Carver, and all of Cape Cod except Bourne. Rising land values and concern for water quality has made landfilling a less attractive option for solid waste disposal; approximately 25 more communities have expressed interest in having SEMASS accept their waste.

The 208 Plan recommended that the state give top priority to development of a disposal site for hazardous wastes. No Massachusetts site has yet been designated and hazardous wastes (including radioactive waste, toxic materials, pathogens, and explosives) are still either transported out of State, or to landfills which are not designed to insulate these materials or treat the leachate they produce. To this date communities have taken a "not in my backyard" stance on hazardous waste facilities. However, many toxic wastes are produced in this State and the lack of a legal disposal facility makes illegal and improper dumping of hazardous materials more likely.

The 208 Plan recommended that the Executive Office of Environmental Affairs rewrite the April 1971 regulations governing landfills to better reflect State and local policies concerning ground and surface water pollution. Specifically, the Plan recommended the following:

1. Permanent groundwater monitoring wells should be installed down gradient from all landfills. Samples from these wells should be analyzed every four months and the results published along with EPA primary drinking water standards.
2. Operations plans should include a description of remedial measures to be implemented to deal with any contamination revealed in the monitoring program.
3. The volume of waste entering the landfill should be reduced through recycling paper, glass and metals and by separately disposing of garbage, leaves and other vegetable matter.
4. All landfills should be under supervision by a person trained in proper landfill operation and management.
5. The volume of leachate should be reduced by impermeable cover on active landfills and capping of abandoned landfills.

The 1971 landfill regulations have not been rewritten, however, DEQE produced an internal memo on policy guidelines in 1979 which presumably addresses proper siting and operation of landfills. A rewrite of the landfill regulations is long overdue. The failure of DEQE to perform this important task is due in part to insufficient staff and funding to keep up with current workloads.

ON SITE SEWAGE DISPOSAL

Properly functioning septic systems add contaminants (particularly nitrates) to the groundwater. When these systems fail, sewage carrying bacteria, organic matter, and nutrients may overflow into surface or ground waters. Septic systems must be properly maintained to prevent failure and subsequent contamination of ground or surface waters. The most common subsurface sewage disposal problem in the Buzzards Bay basin is high density shoreline residential development. Much of this residential development uses sewage disposal that pre-dates current standards (cesspools vs. septic systems, lack of setback).

The 208 Plan recommended that Boards of Health adopt a septic system maintenance program under the authority of Chapter 111 and in conformance with Title 5.

Subsurface disposal systems have been improved from the cesspool designs to septic systems installed under current standards. The biggest improvements to septic system performance can now be achieved with maintenance not engineering. Septic system maintenance programs require periodic pumping to increase the systems treatment efficiency. Regular septic tank pumping prevents failures due to clogged leaching fields, reduces pollutants that would otherwise be discharged into the groundwater, improves the level of decomposition of the wastes by increasing the detention time of the sewage in the system and provides an opportunity for inspection of the system for mechanical failures. Maintenance programs could either require annual inspection and pumping when necessary or require pumping septic tanks once every three years. The pumping service could be provided by the municipality or the homeowner could be responsible for hiring a pumper.

None of the Buzzards Bay basin communities have adopted septic maintenance programs (although Marion is in the process of drafting a local sanitary code which includes maintenance). Although such a program would be much less expensive than sewerage and would extend the useful life of the system for the homeowner, these programs are still considered costly and unnecessary. The Town of Bourne has a mandatory septic system inspection program under the auspices of which a septic system is inspected whenever an application for a building permit or modification of structure is received. The Town of North Kingstown, Rhode Island has used a financial incentive for septic system pumping; the Town offers a refund for approximately half the cost of pumping. Perhaps an incentive like this or a mandatory maintenance program for problem areas would be more successfully implemented.

What Buzzards Bay basin communities have done is to adopt board of health regulations supplementing Title 5 with requirements such as: restriction of percolation tests to the wettest season; increased setbacks of systems from the water table, water supplies and water courses; and restrictions on septic system additives. The Bourne Board of Health adopted a regulation prohibiting on-site sewage disposal systems in flood hazard areas, areas of shifting sand, or areas of high water table.

SEWERING

The 208 Plan suggested several sewerage options for each of the municipalities. The Plan recommended that Selectmen or City Council study and select a sewerage option to pursue. This was recommended so that developed areas inappropriate for on-site sewage disposal would be connected to a municipal wastewater treatment plant. Other recommendations were made for those areas which would remain unsewered.

Several towns have only recently begun or completed studies on sewerage possibilities or feasibility. Many of the lags in addressing sewerage problems have gone hand in hand with the status

of local or regional wastewater treatment facilities. Bourne, for example, completed a 201 study identifying problem areas and needs for sewerage and a wastewater treatment facility or regional tie-in. They must now await the final results of a similar Wareham study and approval of an upgrade and expansion plan for the Wareham POTW, which would handle Bourne in a regional capacity. A draft of the Wareham 201 Study presented in early 1987 recommended sewerage 8 of the 14 areas of town determined to be in greatest need of sewer service. This need was based largely upon continuing septic system problems. Several of these areas were around waterfront or beachfront areas, and thus could have a potential impact upon the overall water quality of the Buzzards Bay area.

Westport, Dartmouth, and Falmouth have all explored sewerage problem areas of town, in conjunction with amended standards for septic systems where necessary or practical. Dartmouth, Fairhaven, and Acushnet have been the most active in terms of their response to sewerage needs as discussed in the 208 study recommendations. In addition, Dartmouth has upgraded and/or amended its septic system regulations four times since 1983.

However, most towns still lag behind in addressing these matters. New Bedford, for example, has only recently considered proposals for rectifying an old and persistent outflow and effluent problem at its wastewater treatment facility (which is a primary treatment facility). Recently proposed plant upgrading plans call for work and studies to be conducted over the next ten years at the New Bedford facility.

MARINE DISCHARGES

The 208 Plan recommended that Selectmen require the installation of sediment catchment basins to contain the runoff from boat washing operations in boatyards. This recommendation was designed to control pollution from anti-fouling bottom paints. These paints contain toxic materials which are scraped off and washed into waterways during boat washing operations.

None of the municipalities within the study area have adopted regulations requiring marinas to install catchment basins. The reasons for this are both political and economical. Such requirements would be unpopular with many boatyard owners because of the cost of construction and the maintenance necessary for proper operation of the basins.

WATER CONSERVATION

Aside from the period of drought in the summer of 1981 (when virtually every town in southeastern Massachusetts undertook emergency water conservation measures), very little has been done in the area of water conservation. Specific concerns were addressed to only a few towns in the Buzzards Bay Study area (Westport and New Bedford in particular) in the 208 Plan, and herein response has been minimal.

ENFORCEMENT

The 208 Plan recommended that local authorities make the provisions of their bylaws and permits available to the public to aid in enforcement. Currently, copies of laws and regulations are often not available through the town clerks as they should be by law. In addition, permit requirements and board guidelines are even more difficult to obtain from the many part-time board members and their staff. This lack of availability of regulatory information makes planning by citizens and applicants difficult and reporting of violations unlikely.

Additional obstacles to the enforcement of local water quality regulations are the large turnover and lack of continuity among the boards and the absence of adequate funding for professional staff or consultants to review project plans and municipal regulations.

SUMMARY: 208 AREAWIDE WATER QUALITY MANAGEMENT PLAN

Overall, the record of implementation of recommendations from the 208 Plan has been sporadic, and generally followed only in a few selected cities and towns, but not throughout the basin. The reasons for the less than exemplary track record are noted below:

1. Lack of follow-up - With the exception of token funding for a couple years, there was no long-term financial commitment on the part of EPA or the Commonwealth to follow-up on the recommendations and provide technical assistance for their implementation. Nationally, the 208 effort was a large, one-shot planning effort that produced good ideas and plans, and created significant momentum, but not enough tangible results. The cut-off of funding was the most significant reason that the 208 effort did not achieve better results.

2. Local fiscal constraints - Shortly after the 208 plans were completed, Proposition 2 1/2 put severe fiscal constraints on local governments' ability to undertake new initiatives. Recommendations such as septic system maintenance programs, marine pump-out facilities, and better enforcement of environmental regulations could not be seriously considered.

3. Limited environmental awareness - Despite significant efforts toward public education as part of the 208 efforts, there was an enormous gap between the level environmental awareness in 1978 as opposed to the present. For example, groundwater was not well understood. In the SRPEDD region in 1976, there were no bylaws for groundwater protection. Today there are more than a dozen. The concept that septic systems needed maintenance was unheard of and people were not aware of what non-point sources of pollution were, and never considered runoff, for example, as a problem for water quality.

AGRICULTURAL WATER QUALITY: A SUMMARY OF BEST MANAGEMENT PRACTICES

INTRODUCTION

Although alluded to in prior areawide water quality studies, agricultural management practices in relation to water quality in the southeastern Massachusetts area were most thoroughly addressed in the Rural Clean Water Program (RCWP) conducted in Westport, Mass. in 1981, under the auspices of an experimental, primarily federally funded work plan (see Rural Clean Water Program, Westport River Watershed Project, Westport, Massachusetts, Plan of Work, 1981).

The U.S. Secretary of Agriculture selected Westport for participation in the RCWP in June of 1981. This selection was based upon the Westport River's recurring water quality problems due to pollution from agricultural sources. Suspected pollution from dairy and other agricultural and livestock operations along both branches of the Westport River had resulted in high coliform bacteria levels in certain shellfish beds in the estuary (to compound the problem, some septic systems were also found to add to the pollution level in the estuary). Further water quality tests conducted by the Massachusetts Department of Environmental Quality Engineering (DEQE) indicated serious point and non-point source pollution problems emanating from agricultural runoff containing dissolved solids, nutrients, pesticides, and bacteria.

A work plan to help alleviate these conditions through the implementation of Best Management Practices (BMP) was developed and overseen in Westport by the Agricultural Stabilization and Conservation Service for the U.S. Department of Agriculture (USDA). The project was administered by a local coordination committee comprised of local, state, and federal agencies. This plan allocated approximately \$800,000 in federal and local funds for farms in the

project area. Under the terms of the work plan, contracts for BMP funding were to be drawn up by 1984-85, with the entire project to be completed by 1991. To date, projects completed through this program have been largely unsuccessful in abating the Westport River problems (although there were successful projects such as the sluice at the Howard Tripp dairy farm and a project at the Clark Chase farm). A number of factors have contributed to the disappointing results achieved thus far in the RCWP/BMP project, including: projects that did not completely adhere to initial design or program objectives; a lack of consistent monitoring of problem/project sites by responsible local officials; and flaws in the federal/state/local coordination/communication process concerning projects (as particularly reflected in several contained feedlot projects).

BMP SUGGESTIONS

In conjunction with the Westport River RCWP, a list of BMP's was created by the USDA, Soil Conservation Service, Economic Research Service, and Forest Service. This list, highly reflective of the recommendations made in the Westport study, was presented in Appendix B of the 1984 Massachusetts Agricultural Water Quality Study.

The following is a summary of the BMP recommendations made in the above-mentioned study:

- Permanent Vegetative Cover--to protect soil and prevent water pollution from agricultural, silvicultural, or non-point sources; components of this practice include fencing, pasture and hayland management, and pasture and hayland planting.
- Animal Waste Control--to be practiced via waste management, diking, fencing, surface drains, field ditches, diversion, and/or other means.

- Stripcropping Systems--designed to protect soil from wind and water erosion and prevent pollution from erosion and runoff through contour, field, or wind stripcropping.
- Terracing--the practice of controlling erosion from water runoff through the implementation of terraced farming in conjunction with underground pipe outlets, mechanical outlets, vegetative protective outlets, and waterways.
- Diversion Systems--employed to prevent pollution from non-point sources via ditches, dikes, subsurface drains, and such diversions.
- Grazing Land Protection System--centers on the protection of vegetative cover to promote land use in such a manner as to inhibit soil erosion and possible subsequent pollution through maintenance of vegetative cover. Possible means of implementation include fencing, pipelines, water storage facilities, cisterns, troughs, or the like.
- Waterway Systems--this practice includes site preparation, grading, shaping, filling, and establishing permanent vegetation for waterways. Components of this practice include fencing, grassed waterway outlets, lined waterway outlets, and subsurface drains.
- Cropland Protective System--incorporates the use of cover crops and field windbreaks to control erosion and water pollution from agricultural non-point sources.
- Conservation Tillage Systems--employed to reduce pollution from sediment and chemically contaminated runoff, and to help prevent soil from wind and water erosion. Tillage operations may consist of: chisel plowing, plow-plant, light tillage, or other such approved methods.

- Stream Protection System--can be implemented to control erosion and prevent pollution of water from agricultural non-point sources. This system can be implemented through: the installation of permanent fencing to protect banks; planting of trees, shrubs, and perennial grass cover to act as filter or buffer areas; and installation of livestock crossings.
- Permanent Vegetative Cover on Critical Areas--to control erosion, sedimentation, and any resultant pollution.
- Sediment Retention, Erosion, or Water Control Structures--including erosion control dams, desilting reservoirs, sediment basins, channel linings, chutes, and drop spillways. These structures are intended to curb water pollution from runoff, erosion, and sedimentation.
- Improved Irrigation/Water Management Systems--including lined irrigation ditches, tailwater recovery systems, etc. for the conservation of soil or water where needed, and permanently installed irrigation systems.
- Tree Planting--to provide protection from wind and water erosion.
- Fertilizer Management--the purpose of which would be to control nutrient movement in critical areas contributing to water pollution. Some components of this practice include: avoidance of fall fertilizer application on sandy soil, a winter cover crop established where needed, and fertilizer application based on a current soil test.
- Pesticide Management--this practice stresses compliance with federal, state, and local authorized and registered uses in distribution areas and levels of pesticide. Ideally, such conscientious practices would curb water pollution due to pesticide runoff.

OVERVIEW OF THE SOUTHEASTERN NEW ENGLAND WATER AND RELATED LAND RESOURCES STUDY

In 1974, the Waters and Related Land Resources Study was prepared for the Southeastern New England (SENE) Study as conducted by the New England River Basins Commission.

This report, a predecessor to the 1976 DEQE Basins Report and the 1978 208 Water Quality Management Study, focused on the nature of problems associated with urban waterfront development, water quality, and water-related land areas and approaches for dealing with those problems.

Some specific problem/solution approach scenarios explored in the SENE Study were:

- Preparation of municipal waterfront plans directed by state and regional guidelines and priorities developed on the model of the coastal zone management program with review requirements of environmental impact statements.
- The establishment of economic, environmental, and design guidelines for waterfront planning, which include preservation of historic and related tourist attractions and creation of new development parcels.
- To achieve swimmable/fishable waters by 1983 wherever realistically attainable economically, socially, and technically. This was to be accomplished by such means as: anti-degradation policies, alleviating runoff from urban developments, treatment of urban stormwater flows, region-wide stormwater wet weather stream sampling, formulating a municipal sludge disposal policy, defining the landfill leachate problem, and emphasizing industrial permit program for water disposal strategies.

- Reduction of inland and coastal flood damage as well as coastal erosion by such methods as: floodplain programs, adopt zoning to prevent new floodplain construction, acquisition of key wetlands and floodplains, establish local regulations to control runoff and erosion, establish inland sediment and erosion control ordinances, manage critical erosion through coastal zone programs, encourage stabilization of coastal erosion areas, and build or restore salt marshes.
- Maintenance of the region's renewable marine resources such as fishing grounds and shellfish beds. This would be accomplished through such recommended practices as: adoption of a national fisheries management policy, accommodation of coastal fishing facilities through improved planning, identify potential aquaculture sites, move sewage discharges away from estuaries, increased technical assistance to local shellfish management programs, and create a region-wide port development strategy.
- Implementation of strategies for protecting critical water and related land resources in the region, while accommodating economic activities and growth through increased protection of critical environmental areas and improved management of developable areas (by resource capability, judicious use and expansion practices, and regulation of large-scale development).

In essence, the SENE Study addresses the question as to whether or not Southeastern New England can accommodate predicted growth and provide adequate economic opportunities while protecting the natural resources of the region. The conclusion of the SENE Study is that this is entirely possible by applying the study's recommended practices in establishing regional goals.

LOCAL ACTION TAKEN SUBSEQUENT TO SENE

Historically local response to SENE was negligible. What SENE did, however, was to usher in a period of increased federal and state coastal study/planning. Although the SENE Study was the first, the

period 1974 - 1980 (post-SENE) produced numerous, more thorough, issue-oriented reports and studies focusing on coastal problems throughout southeastern New England. Foremost amongst these reports was the EPA-funded 208 Water Quality Areawide Management Plan (1974 - 1978). In accordance with some of the recommendations made and subsequent studies, various cities and towns in the Buzzards Bay area took steps toward improvements in identified problem areas. In some instances, state and federal programs (CZM, EPA) have provided the impetus for developing solutions to the problems initially addressed in the SENE Study. Some examples of state and local programs implemented in the wake of SENE, 208 and subsequent studies are as follows:

- Preparing Waterfront Management plans in accordance with state and regional guidelines...including economic, recreational, environmental, and historic preservation considerations:

In early 1987, the Massachusetts Coastal Zone Management Program (CZM) developed guidelines for harbor management. These guidelines are designed to aid local harbor planning commissions (which have become very active in the last decade in the Buzzards Bay/southeastern Massachusetts area) in implementing best management practices in addressing waterfront growth. CZM has recently conducted a series of harbor planning conferences in Massachusetts coastal communities to present these new guidelines and assess local needs.

Further, cities such as New Bedford and Fall River are in an ongoing process of developing responsible commercial waterfront planning, while towns such as Fairhaven, Wareham, and Marion have centered management plans more on recreational issues.

Another aid to cities and towns in their waterfront planning pursuits is the Coastal Facilities Improvement Program (CFIP). The CFIP was created as part of the 1983 Coastal

Protection Bill (Ch. 589 of the Acts of 1983), and is administered by CZM. The CFIP provides financial assistance on a reimbursable basis to coastal cities and towns so that they can plan for, construct, reconstruct, maintain, and improve their public coastal facilities.

Two of the beneficiaries of the CFIP program in and around the Buzzards Bay area are New Bedford and Somerset. New Bedford received assistance from CFIP for the extension of Steamship Pier and renovation of the fender system. Somerset received CFIP assistance in developing a stretch of coastal waterfront beach and park areas in 1985 and 1986 (Village Waterfront Park and Pierce Beach Park).

- Achieving swimmable/fishable waters by 1983 wherever realistically attainable:

Much of the basis for such an undertaking was addressed and put forth in the form of recommendations in the 1978 208 Water Quality Areawide Management Plan, prepared for southeastern Massachusetts by SRPEDD.

- Reduction of inland and coastal flood damage as well as coastal erosion:

Presently, all cities and towns in the SRPEDD area, including those around Buzzards Bay, are in floodplain zoning programs in conjunction with the Federal Emergency Management Agency (FEMA). Most of the stabilization programs (for control of erosion and sedimentation) are being phased out or totally abandoned. An example of a failed stabilization attempt in the Cape Cod/Buzzards Bay area is the Pilgrim RC&D Plymouth stabilization program. After several years of employing various mitigating techniques on the Plymouth coastline, continued loss of coastal material through wind and water erosion has resulted in the termination of this effort by RC&D.

- Maintenance of the region's renewable marine resources, such as fishing grounds and shellfish beds:

Incentives to cities and towns in this area is provided by the Division of Marine Fisheries in the form of available funding for increased technical assistance to local fisheries management programs.

Locally, Marion (with aquaculture provisions in town regulations) and Westport (with one of the better shellfish propagation programs) have been very active in the area of maintenance of renewable marine resources.

- Implementation of strategies for protecting critical water and land-related resources while accommodating regional growth:

In addressing this problem, several cities and towns have complemented the protection afforded under the Massachusetts Wetlands Protection Act (MGL Ch. 131) by adopting bylaws or provisions to existing bylaws. (For a comprehensive list of cities and towns in the Buzzards Bay area that have implemented such provisions and/or bylaws, see The Buzzards Bay Inventory, SRPEDD, 1986.) In the Buzzards Bay area, the majority of effort in addressing the need for protecting critical land and water areas has centered on the development of wetlands and aquifer protection bylaws. Since the late 1970's, several cities and towns have taken such measures, while others are now in the planning stages.

Some good examples of local provisions and bylaws in the critical water and land resource-related areas are the Falmouth nutrient loading provision in the town Subdivision Regulations, the Dartmouth Aquifer Protection Zoning Bylaw, the Dennis Wetlands Protection Bylaw, the Marion Aquifer Protection Bylaw, and the Falmouth Aquifer Protection Bylaw.

These bylaws and ordinances are not, however, definitive. But, each emphasizes the need and illustrates the ability of cities and towns to take the initiative to protect their valuable resources. Further, once these protection mechanisms have been put in place, a process of continuous environmental monitoring, evaluation and needs assessment is made more efficient and practicable on the community level.

POSTSCRIPT

In the wake of SENE, 208 and other comprehensive coastal resource and water quality protection plans, change has come slowly. Yet, the past five years have seen a shift towards greater resource awareness, appreciation and protection, almost universally, throughout the Buzzards Bay region and a good portion of southeastern New England.

In Massachusetts, the past three years (1986-88) have done nothing if not illustrated the continued relevance of the 1978 208 plan issues and recommendations. The state, through the passage of the Solid Waste Management Bill, has addressed the need to recycle, compost and practice source reduction in order to ease solid waste disposal burdens. Numerous sewerage and wastewater treatment plant expansions were completed or have begun since 1981, in an effort to curb the effects of septic system leachate into our groundwater. The state, under the auspices of DEQE, has formed a study committee to assess and suggest amendments to Title V. The recommendations of this committee should be aired in a series of public hearings sometime in the spring of 1989. The state, through the DPW, is experimenting with reduced salt/de-icing chemicals on state highways. Salt reduction was undertaken in order to curb the amount of road run-off pollution incurred by wetlands and waterways bordering highways. Many towns and cities have also created reduced salt application areas on roadways in and around environmentally sensitive areas. Some towns, such as Marion, have adopted stringent sanitary codes addressing such pertinent concerns as septic system performance standards, provisions for seasonal home conversions, etc. (as of 12/6/88).

What is the major difference between water quality concerns as expressed and acted upon in 1978 and those in 1988? Realization. The realization that the concerns expressed in the 1970's were legitimate and that our resources are finite. The realization, especially in the recent number of comprehensive groundwater protection and solid waste plans and legislative activities, that water quality problems will not solve themselves, nor will landfills and dumps last forever. The realization that long-range planning is necessary to adequately deal with environmental issues before they become overwhelming (both in magnitude and capital outlay). And finally, the realization that because we failed to properly address and implement changes based upon our issue related planning from 1974 - 1978, we've wasted time and valuable resources, some of which we can never hope to reclaim.

But, as we approach the 21st century, the renewed interest and vigor with which we address our water quality and natural resource concerns can help to mitigate the effects of our initial tentativeness. Nationwide, programs such as the EPA Buzzards Bay Project are realizing results and promoting long-range planning. To be successful, we must continue the momentum of the past few years. Federal, state and local coalitions, agencies and interest groups must continue to function in a cooperative and participatory fashion to meet the needs of an ever-changing environment.

BIBLIOGRAPHY

Cape Cod Planning and Economic Development Commission 1978
208 Water Quality Management Plan for Cape Cod.

New England River Basins Commission 1975 Report of the Southeastern
New England Study. A strategy for balanced development and
protection of water and related land resources in eastern
Massachusetts and Rhode Island.

Southeastern Regional Planning and Economic Development District
1978 208 Water Quality Areawide Management Plan for southeastern
Massachusetts.

United States Department of Agriculture, Soil Conservation Service
1984 Massachusetts Agricultural Water Quality Study, Appendix B,
"Best Management Practices."



